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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,566	07/16/2003	Takahisa Tanabe	US01-02091	7111
21254 7590 01/31/2007 MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817			EXAMINER CRANE, SARA W	
			ART UNIT	PAPER NUMBER
			2811	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/31/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/619,566

Applicant(s)

TANABE, TAKAHISA

Examiner

Sara W. Crane

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al.

See reasons of record in the Office action of 6 October 2004.

Claims 18-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al., and further in view of Joseph and Menon, "Device characteristics of NiPc static induction transistor," and Joseph and Menon, "Device preparation and characteristics of CuPc transistor, and Dimitrakopoulos et al.

With respect to claim 18, the two articles of Joseph and Menon each teach static induction transistors having an organic semiconductor (Pc, see Dimitrakopoulos et al., column 5, lines 38-42), and first and second electrodes of Al and FTO, which, being different materials, would inherently or obviously have different work functions. Because Pc is a semiconductor, it would have hole and electron mobilities due to the conduction by electrons or holes as occurs in semiconductors, because of the band gap. With respect to claim 19, Dimitrakopoulos et al. teaches at column 5, lines 40-41, that pentacene is a desirable alternative semiconductor to Pc. With respect to claim 20, the transistors of Yang et al. and Joseph and Menon all have electrodes in contact with the semiconductor. With respect to claims 21 and 22, each of these references shows

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both top and bottom contacts. With respect to claim 23, the semiconductor materials would transport electrons. With respect to claim 24, the middle electrode of the vertical devices of Yang et al., or Joseph and Menon is a gate electrode. With respect to claim 25, the gate electrodes in the Joseph and Menon papers are Al. With respect to claim 26, the electrodes at each end of the current flow path serve as source or drain for the carriers comprising the current, depending on whether the semiconductor is doped to have majority current flow of either holes or electrons. With respect to claim 27, the "first electrode" can be read on the material having greater work function. With respect to claims 28-29, the Joseph and Menon device has Al as drain and tin oxide as source. Indium tin oxide would have been obvious in view of the teaching of tin oxide, because this is a known type of tin oxide, having known and desirable properties, such as transparency and high electrical conductivity. With respect to claim 30, each of the vertical, or SIT-type, transistors has a bottom contact, and, as noted above, the different materials for top and bottom electrodes would have different work functions.

Conclusion

Applicant has argued with respect to the Yang reference that this device is not a transistor. Column 14, lines 24-31, teaches that the device is analogous to npn or pnp transistors. (Also, a grid electrode between top and bottom electrodes is identified in Applicant's figure 6 as a static induction transistor, which is a type of transistor.) Applicant also argues that Yang et al. does not utilize semiconducting materials. The materials are shown in figures 2 and 3 as having a band gap, so they must be

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semiconducting. See also, column 10, lines 50-63, and column 14, lines 28, which make it clear that the materials used are semiconducting. Applicant argues that criticality of the claimed work function ranges is shown "in the Application." Where in the application? Page 6, at the bottom, for example, sets forth ranges, but doesn't explain why these ranges are critical (as opposed to larger or smaller ranges). This is precisely the sort of argument that can be readily relied upon for patentability, but something more than a mere allegation of criticality would be required.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

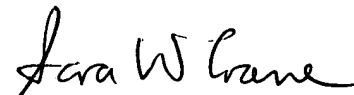
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (571) 272-1652.

The supervisor for Art Unit 2811, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sara W. Crane
Primary Examiner
Art Unit 2811